DOCUMENT RESUME

ED 058 941 PS 005 211

AUTHOR Thoman, Evelyn B.; And Others
TITLE Neonate-Mother Interaction during Breast-Feeding.
INSTITUTION Stanford Univ., Calif. Dept. of Psychiatry.
SPONS AGENCY National Institutes of Health (DHEW), Bethesda, Md.
NOTE 28p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Behavioral Science Research; *Infants; Longitudinal Studies; *Mother Attitudes; Parent Attitudes; *Parent Child Relationship; *Stimulation

ABSTRACT

Using a modified time-sampling procedure, 20 primiparous and 20 multiparous mothers were observed while breast-feeding their 48-hour old infants. In comparison with multiparous mothers, primiparous mothers (1) spend more time in non-feeding activities, (2) spend more time feeding male infants, (3) change activity more frequently, (4) provide more stimulation for their infants, (5) talk to their infants more, far more with female infants, and (6) smile more at female infants. Infants of primiparous mothers spend less time attached to the nipple, and when attached, they spend less time sucking. Longitudinal observations revealed that, for the primiparas, the number of weeks the infants were breast-fed was related to the amount of time the mothers talked to the infants at the two-day feeding observation. (Author)

ED 058941

Abstract

Using a modified time-sampling procedure, 20 primiparous and 20 multiparous mothers were observed while breast-feeding their 48-hour old infants.

In comparison with multiparous mothers, primiparous mothers (1) spend more time in non-feeding activities, (2) spend more time feeding male infants, (3) change activity more frequently, (4) provide more stimulation for their infants, (5) talk to their infants more, far more with female infants, and (6) smile more at female infants. Infants of primiparous mothers spend less time attached to the nipple, and when attached they spend less time sucking. Longitudinal observations revealed that, for the primiparas, the number of weeks the infants were breast-fed was related to the amount of time the mothers talked to the infants at the two-day feeding observation.

PS 00521

ED 058941

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

In press - Developmental Psychology

NEONATE-MOTHER INTERACTION DURING BREAST-FEEDING[1]

Evelyn B. Thoman[2], P. Herbert Leiderman[3], and Joan P. Olson

Department of Psychiatry, Stanford University School of Medicine

The first and perhaps the most critical early social event in a child's life involves the feeding interaction between the mother and her child. Mavis Gunther (1959) has reported that events in the very first feeding of an infant may affect numerous subsequent feedings. If an infant has a brief smothering experience with the mother's breast, he may fight when put to the breast during many feedings thereafter. Reciprocally, it could be expected that the mother of such a rejecting and uncooperative infant would be affected by this behavior on the part of her infant. Brazelton (1962) reports a case history of a difficult neonate in which he describes a disruption of the mother-child relationship and the subsequent deleterious effect on development of that child. These examples point up the importance of the earliest reciprocal relationship of the mother and infant for subsequent development of their interdependent patterns of behavior.

PS 005211

Evidence supporting the concept of a reciprocal relationship between a mother and her infant during feeding has been reported in previous studies of bottle-fed infants (Thoman, Barnett, & Leiderman, in press; Thoman, Turner, Leiderman, & Barnett, 1970). Parity was found to affect several dimensions of this interaction: Primiparous mother-infant pairs spent more time in the total feeding period, they devoted more time to feeding activities, and they used more feeding periods in the process. The infants of primiparous mothers consumed less formula during a feeding and their consumption rate was lower. Furthermore, by comparing mother-infant and nurse-infant feedings,

it was possible to separate the contribution of the mother and the infant to the interactive patterns observed. That the infant did contribute to the differences associated with parity was suggested by the finding that the infant's feeding behaviors differed as a function of parity of the mother before any feedings were ever given by the mother.

In order to extend our study of early interaction during feeding, the present study was designed to examine the behaviors of neonates and their mothers during breast-feeding. Behavior patterns associated with both the parity of the mother and the sex of the infant were examined. In addition, we explored the relationship between interactive behaviors observed during the neonatal period and a later behavior of mothers with their infants. Specifically, measures of feeding behaviors of two-day old infants were related to the total number of weeks the mothers breast-fed their infants. The value of empirical analyses of the earliest mother-infant relationship will be convincingly demonstrated only when measures of early behaviors are predictive of subsequent behaviors.

Method

Subjects

A group of 18 mother-infant pairs were used for determining the reliability of all measures of feeding behaviors to be used in the main study. These mothers and their infants were in the maternity ward at Stanford Medical Center, and they were not selected on the basis of any criteria other than that the mother and the infant were reasonably well and the mother consented to the presence of two observers during the feeding.

The study proper included 40 subjects, 20 primiparous and 20 multiparous mothers and their infants, with an equal number of males and females in each group. Subjects were selected by a third person and assigned to one of the two observers without providing them with information as to the parity of

the mother or the sex of the infant.

Mother-infant pairs were selected only if they met these criteria: maternal age between 18 and 38 years; mother had no history of previous abortions or miscarriages; infant Rh positive, single birth, full-term; birth weight between 5 pounds 6 ounces and 9 pounds 6 ounces; Apgar rating (Apgar, 1953) of 8 or above at 1 minute; spontaneous delivery or through low forceps, vertex presentation; maternal depressant drugs not exceeding 200 milligrams, 1 to 6 hours prior to delivery and no signs of fetal or postnatal anoxia.

Educational levels and professional occupations were slightly higher for the multiparas and their husbands. Most subjects and husbands in both groups had some college education and were engaged in professional or semiprofessional occupations. All subjects were American-born Caucasians.

The population parameters of the mothers and infants in the two groups, including the ages of the mothers, the birth weights of the infants, the ages of the infants at the time of the feeding observation, and the number of feedings the mother had given the infant prior to the feeding observed are given in Table 1.

Insert Table 1 about here

Apparatus

For the purpose of obtaining timed observations, a small electronic timer provided a click signal every 10 seconds to the observer through an ear microphone.

Procedure

For the reliability observations, we explained to the mothers that we were interested in the behaviors of normal, healthy, full-term infants and

that we wished to observe infants not only in the nursery but also when they were with their mothers. We showed her the timing device, explained its use and obtained her consent to allow the presence of two observers during a feeding.

The procedure for the subjects in the study proper was somewhat different from that just described. Primarily, the difference was that there were two observations made on each subject, at the 9:30 a.m. and the 1:30 p.m. feedings on the same day. Only one observer was present at each feeding. Only the data for the second observation were used for our analyses. The purpose of the first observation was to adapt the mother to the presence of an observer during the feeding. Furthermore, the first observation was not made by the same observer as that for the 1:30 observation. During this first observation, the purpose of the study was explained to the mother, her consent was obtained, and a brief demonstration was given to her of the observation procedure. At this time, it was also explained that at 1:30, the observer would not be able to talk with the mother as she would be preoccupied with the recording. At 1:30, by prearrangement, the observer and infant arrived in the mother's room simultaneously and observations were begun immediately. This procedure also served the function of protecting the second observer from information about the parity of the mother and sex of the infant which is inevitably disclosed during any conversation with a new mother. Following the observation period, the mothers were interviewed briefly to determine whether lactation had been initiated.

Procedure for Making the Observations

For making the observations, we used a check sheet on which the following three major categories of activities were listed: 1) breast-feeding, 2) water-feeding, and 3) non-feeding. Under these major categories were columns under which the observer could indicate whether or not the infant was attached to the nipple; if attached to the nipple, whether or not the

infant was sucking; whether the mother was stimulating the infant with the nipple, or stimulating the infant on the cheek or chin, or providing general stimulation to the body; when the mother was talking or smiling; and when she was holding the infant away from her body during non-feeding activities. The observer watched the mother and infant during each 10-second interval and, at the sound of the signal click, noted the behaviors that had occurred during the interval. For most of the behaviors, a code was used to indicate whether the behavior, if it occurred, was judged to have persisted for 5 seconds or throughout the entire 10-second interval of observation. The code for sucking was more refined, so that a notation was made as to whether the infant was judged to have sucked for 3 seconds, 7 seconds, or throughout the entire 10-second interval.

This procedure is in contrast to the typical time-sampling procedure in which observation is made for a brief period at the end of a time interval. It was determined that the observers spent approximately 2 seconds in achieving the notations; thus the observations were continuous for 8 out of every 10 seconds.

Results

The results of the observations of subjects used for reliability measures are shown in Table 2. Only those behaviors for which correlations are shown on this table were used in the final analysis of the data.

Insert Table 2 about here

For the study proper, an analysis of variance was used for each variable in order to assess the effects of parity of the mothers and the sex of the infants separately. Probability levels of .10 and beyond are reported. However, in our interpretation we place greatest weight upon those findings

PS 00521

significant at the .05 and .01 levels.

The amount of time spent on each of the major activities, including breast-feeding, water-feeding, and non-feeding are presented in Figure 1.

Insert Fig. 1 about here

The combined time for these activities constitutes the total observation time for each of the four groups. The percent of the total time that was devoted to each of the three categories of activity are also indicated in Figure 1.

The primiparous mothers clearly spent more time in non-feeding activities, not only in terms of amount of time spent ($F = 11.82$, $df = 1/36$, $p < .01$), but also in terms of percent of total time devoted to non-feeding activities ($F = 10.71$, $df = 1/36$, $p < .01$).

There is an effect of the sex of the infant on the amount of time spent in the breast-feeding activity. Primiparous mothers spent a greater percent of the total observation time breast-feeding males and multiparas spent a greater percent of feeding time with females. This interaction effect is a significant one ($F = 4.60$, $df = 1/36$, $p < .05$).

The analyses of the number of intervals used in each major category of activity are shown in Table 3. This measure consistently discriminates the

---

Insert Table 3 about here

---

two parity groups; that is, the primiparous mothers use a greater number of periods in each of the major activities as well as a greater total number of periods.

Behaviors that occurred during each of the major activities, breast-feeding, water-feeding, and non-feeding, were analyzed separately using percent of time for that activity as the basic measure for each behavior.

Behaviors during the Time at the Breast

Comparisons of the groups with respect to the behaviors that occurred during breast-feeding are presented in Table 4. These data indicate that

---

Insert Table 4 about here

---

primiparous mothers provide more general stimulation for their infants during the breast-feeding periods.

The amount of talking by the mother during breast-feeding periods was highly related to the sex of the infant. Primiparous mothers talk more to their infants during breast-feeding, and primiparous mothers with females talk much more to their infants than do primiparous mothers with male infants, whereas multiparous mothers may talk more to their infant if it is a male.

The mean percent of breast-feeding time that infants in each group spent attached to the nipple are indicated in Table 4. Infants of primiparous mothers spent less time attached to the nipple, that is, these mothers and infants spent a greater percent of the time at the breast in efforts to achieve nipple attachment. Further, while attached, infants of primiparous mothers sucked less.

Some of these differences in behaviors raised the question as to whether initiation of lactation, which is known to occur earlier in multiparous mothers, might have been a source of the difference between the two groups. At 48 hours postpartum, when our feeding observations were obtained, lactation

had begun in 3 of the primiparous mothers and 8 of the multiparous mothers. In order to assess the influence of lactation, we did a 2 x 2 analysis of variance of each of the breast-feeding measures using parity and whether or not lactation had begun as the independent variables. None of the breast-feeding measures, including time spent at the breast, were affected by the presence of lactation except the time spent "not attached to the breast." Both groups of mothers spent a greater amount of time "not attached to the breast" if lactation had not begun. Therefore, it was necessary to control for lactation effects in order to assess the effects of parity on this particular measure. Lactation as a source of variation was removed statistically by means of analysis of covariance; and the resulting difference between the two parity groups was accentuated; that is, the time spent "not attached to the breast" is greater for primiparas, and $p < .02$ rather than .10 as indicated in Table 4. These results clearly indicate that parity, over and above the effects of lactation, influenced the time spent "not attached to the breast."

During the course of the breast-feeding observations, we became aware of an additional form of behavior that differed markedly for the two groups: the amount of time the infant made sucking movements while the mother was endeavoring to put the infant to the breast. This measure was included after 10 subjects had been observed. Only in 3 of 18 infants of multiparous mothers observed did this behavior occur at all, with a mean duration of 23 seconds; whereas in 8 out of 12 infants of primiparous mothers, sucking movements were made, with a mean duration of 87.5 seconds. This dramatic parity difference, which is obvious without statistical tests, clearly depicts the difference in effectiveness of the experienced and inexperienced mothers.

Behavior during Water-feeding

Analyses of behaviors that occurred during water-feeding are presented in Table 5. Five of the multiparous mothers did not give water to their infants at any time, whereas all 20 primiparas offered water to their infants

---

Insert Table 5 about here

(χ^2 = 5.714, df = 1, $p < .05$). Parametric tests were not appropriate for the data from the remainder of the subjects because of the great variability within groups. The Kruskal-Wallis H statistic was used for the analyses for water-feeding measures.

There were no significant differences in the amount of infant sucking on the nipple of the water bottle. Primiparous mothers stimulated their infants more and talked to them more during water-feeding. And primiparous mothers smiled at their girl infants more during the water-feeding periods.

Behaviors during Non-feeding Periods

Behaviors observed during the non-feeding periods are presented in Table 6. There are no significant group differences for any of the measures

---

Insert Table 6 about here

---

during non-feeding periods. However, as already noted, there was a marked difference in the absolute amount of time devoted to non-feeding activities by the two parity groups. This suggested the possibility of a difference in the absolute amount of stimulation received by the groups of infants during the non-feeding portion of an infant's feeding, which would not be revealed by the comparison of percentages generally used for our data analyses. In fact, this was the case. The mean number of seconds of stimulation during

non-feeding intervals were: primiparous males, 261.0; primiparous females, 493.0; multiparous males, 173.0; and multiparous females, 144.1. Primiparous mothers provided significantly more stimulation for their infants ($F = 7.98$, $df = 1/36$, $p < .01$).

Behaviors during Total Observation Time

An overall view of the amount of stimulation and talking and smiling (mean percent of total observation time) mothers do during the entire feeding observation is presented in Table 7. Again, we see the differences in the

---

Insert Table 7 about here

---

amount of general stimulation and talking. The primiparous mothers stimulated their babies and talked to them during the greater portion of the observation period.

The mean number of weeks the mothers in each group breast-fed their infants are presented in Table 8. Since there was a perfect correlation among the groups with respect to the amount of time spent talking to the

---

Insert Table 8 about here

---

infant at the observation made two days postnatally and the length of time the infants were breast-fed, a correlation was obtained for each parity group. The correlation for the multiparous groups was $r = .25$, which did not reach significance. However, the correlation within the primiparous group of mothers and infants was $r = .57$, which was significant at the .001 level. Among the primiparous mothers then, those who talked to their young during the two-day feeding observations were more likely to breast-feed their babies for a longer period of time.

Discussion

The results of this study indicate that there are marked and measurable differences in the interactions of mothers with their first newborns and mothers with later newborns in the feeding situation. These differences may be the effects of the variety of ways in which multiparous mothers differ from primiparas, including physiological and hormonal changes with parity, as well as the influences of previous experience in bearing and caring for an infant. It should be expected that the infant, likewise, contributes to the parity effects on the interactive behaviors as a function of physiological (Gemzell, 1954; Turnbull, 1959; Walker, 1959; Weller & Bell, 1965) as well as behavioral differences (Thoman, Barnett, & Leiderman, in press) in neonates which have been found to be associated with being first- or later-born. Bell (1971) and Harper (1971) have reviewed extensive evidence for the significance of the role of the young in the early development of mother-infant interaction. Thus, there are a complex of maternal and infant factors associated with parity that may influence the early interaction. The present study does not permit a direct separation of specific effects, but identifies patterns of feeding interaction that result.

The patterns of interaction observed in breast-feeding mothers and infants in the present study were found to parallel those previously reported for bottle-feeding mother-infant pairs (Thoman et al., 1970; Thoman et al., in press) with respect to greater time being devoted to the feeding process and greater number of changes in activity on the part of primiparous mothers. It should be noted that the similarities of bottle- and breast-feeding mother-infant behaviors are apparent despite very different observational procedures: measures during bottle-feeding were obtained by means of an automatic recording device with no observer present.

These studies implicate the earliest mother-infant interaction in the findings of differences between first-born and later-born individuals in their subsequent psychological development. Higher need achievement scores, greater anxiety, and greater conformity have been frequently reported for first-borns. These characteristics have been associated with findings that mothers differ in their interaction with first- and later-born children. Mothers are generally more attentive to first-borns (Koch, 1954); they are more directive of the first-born (Lasko, 1954; Stout, 1960) and they exert more pressure on the first child for achievement and responsibility (Davis, 1959; McArthur, 1956; Rosen, 1961; Sampson, 1962; Sutton-Smith, Roberts, & Rosenberg, 1964). Mothers are more inconsistent in their training of the first-born (Hilton, 1968; Sears, Maccoby, & Levin, 1957); and they interfere more with the first child (Hilton, 1968).

It should be noted that studies of birth order effects have been almost exclusively concerned with children over 2 years of age and their interaction with the mother. Yet these same characteristics of mother-child relationship are already apparent in the very earliest feeding interaction. For instance, inconsistency on the part of the inexperienced, primiparous mothers is clearly indicated by the greater number of feeding intervals used, that is, she changes the nature of the ongoing activity more frequently. Likewise, greater attentiveness and persistence of the primiparous mother are indicated by the longer time periods devoted to the feeding activities, the greater amount of stimulation of the infants, and more talking on the part of these mothers.

The results of the feeding studies also provide evidence that the primiparous mother interferes with or dominates the feeding interaction to a greater degree than the multiparous mother. In the earlier study of bottle-feeding mothers and infants (Thoman et al., in press), the mother's

behavior was apparently the primary determinant of the number of feeding periods, as indicated by the differences between measures taken when the infant was fed by the mother and when fed in a controlled situation (i.e., by a nurse). With respect to the number of periods used, the primiparous mother-infant pairs deviated to a greater extent from the nurse-infant pairs than did the multiparous group of mothers and infants. The same parity difference in the number of feeding periods holds for the present study of breast-feeding subjects, although a comparable control group was not possible for breast-feeding infants. The results of this study point to the dominance of maternal influence by way of the amount of time the infants spent sucking. Infants of primiparous mothers spent less time sucking although their mothers spent more time stimulating them to feed. Since external stimuli can act to suppress sucking, it seems probable that the efforts of the primiparous mothers who attempt to stimulate feeding may actually have an inhibiting effect on the desired behavior. This also suggests that primiparous mothers in the breast-feeding situations are less capable of responding effectively to their infants' cues and are less able to provide the interactive mesh more apparent in the multiparous mother-infant pairs.

The results of the present study also demonstrate that the parity of the mother differentially affects interaction with male and female infants during the earliest days. These sex differences, beginning very early in the mother-infant interaction, may be significant antecedents to the finding of sex differences in the mother's interaction with older infants reported by Moss and Robson (1968), and in the development of vocalization by Levine, Fischman, and Kagan (1967). Thus, the earlier verbalization of female children may have its origin in the earliest mother-infant relationship.

A final finding in the study relates to the observation that mothers' talking to their infants during the feeding in the neonatal period is

positively related to the total number of weeks she breast-feeds her infant. Thus, it should be clear from the results of this and our previous studies that many of the psychological characteristics of the child may have their inception in the very first contacts between the mother and her infant. This indication of the importance of the neonatal period for the development of interactive behaviors between a mother and her infant strongly emphasizes the importance of further examination of the details of this early period for understanding behavior in later childhood and adulthood.

References

Apgar, V. A proposal for a new method of evaluation of the newborn infant. Current Researches in Anesthesia and Analgesia, 1953, 32, 260-267.

Bell, R. Q. Stimulus control of parent or caretaker behavior by offspring. Developmental Psychology, 1971, 4, 63-72.

Brazelton, T. B. Observations of the neonate. American Academy of Child Psychiatry, 1962, 1, 38-58.

Davis, A. American status systems and the socialization of the child. In C. Kluckhohn & H. A. Murray (Eds.), Personality in nature, society, and culture. New York: Knopf, 1959.

Gemzell, C. A. Variations in plasma levels of 17-hydroxycorticosteroids in mother and infant following parturition. Acta Endocrinologica, 1954, 17, 100-105.

Gunther, M. Infant behavior at the breast. In B. M. Foss (Ed.) Determinants of infant behaviour. New York: J. Wiley & Sons, 1959.

Harper, L. V. The young as a source of stimuli controlling caretaker behavior. Developmental Psychology, 1971, 4, 73-88.

Hilton, I. The dependent first born and how he grew. Paper presented at the meeting of the American Psychological Association, San Francisco, August/September 1968.

Koch, H. L. Child psychology. Annual Review of Psychology, 1954, 5, 1-26.

Lasko, J. K. Parent behavior toward first and second children. Genetic Psychology Monographs, 1954, 49, 97-137.

Levine, J., Fischman, C., & Kagan, J. Sex of child and social class as determinants of maternal behavior. Paper presented at Annual Meeting of American Orthopsychiatric Association, Washington, D.C., March 1967.

McArthur, C. Personalities of first and second children. Psychiatry, 1956, 19, 47-54.

Moss, H. A. & Robson, K. S. Maternal influences in early social visual behavior. Child Development, 1968, 39, 401-408.

Rosen, B. C. Family structure and achievement motivation. American Sociological Review, 1961, 26, 574-585.

Sampson, E. E. Birth order, need achievement, and conformity. Journal of Abnormal and Social Psychology, 1962, 64, 155-159.

Sears, R. R., Maccoby, E. E., & Levin, H. Patterns of child rearing. Evanston, Ill.: Row, Peterson, 1957.

Stout, A. M. Parent behavior toward children of differing ordinal position and sibling status. Unpublished doctoral dissertation, University of California, 1960.

Sutton-Smith, B., Roberts, J. M., & Rosenberg, B. G. Sibling associations and role involvement. Merrill-Palmer Quarterly, 1964, 10, 25-38.

Thoman, E. B., Barnett, C. R., & Leiderman, P. H. Feeding behaviors of newborn infants as a function of parity of the mother. Child Development, in press.

Thoman, E. B., Turner, A. M., Leiderman, P. H., & Barnett, C. R. Neonate-mother interaction: effects of parity on feeding behavior. Child Development, 1970, 41, 1103-1111.

Turnbull, A. C. Uterine contractions in labour and their possible effects on the foetus. In J. Walker & A. C. Turnbull (Eds.), Oxygen supply to the human foetus: A symposium. Oxford: Blackwell Scientific Publications, 1959.

Walker, J. The influence of clinical conditions on the oxygen available to the baby. In J. Walker & A. C. Turnbull (Eds.), Oxygen supply to the human foetus: A symposium. Oxford: Blackwell Scientific Publications, 1959.

Weller, G. M. & Bell, R. Q. Basal skin conductance and neonatal state. Child Development, 1965, 36, 647-657.

Footnotes

1. This study was supported by a grant (RR-81) from the General Clinical Research Center's Program of the Division of Research Resources, National Institutes of Health.

2. Supported by U.S. Public Health Services Training Grant HD-00049, Department of Pediatrics; and General Research Support Grant RR 5353, Stanford University School of Medicine, Stanford, California. Requests for reprints should be sent to this author, Department of Psychiatry, Stanford University School of Medicine, Stanford, Calif. 94305.

3. Supported by the Grant Foundation, New York, and National Institutes of Health Grant HD 02636, Department of Psychiatry.

Table 1

Means of the Ages of the Mothers, Birth Weights of the Infants, Ages of the Infants at the Time of Feeding Observation, and Number of Previous Feedings

	Primiparas (N = 20)	Multiparas (N = 20)
Mothers' ages (years)	25.4 ± 4.1*	28.3 ± 3.3
Infants' ages (hours)	48.6 ± 4.5	48.5 ± 5.0
Infants' birth weights (pounds)	7.4 ± 0.7	7.7 ± 0.9
Number of previous feedings	6.0 ± 1.0	5.7 ± 1.1

* Mean ± standard deviation.

Table 2

Observer Correlations for Each Variable

Separated for Category of Activity

(N = 18 unless noted otherwise)

	Breast	Water	Out
Infant:			
Not attached	.93	.95	-
Attached -			
Not sucking	.88	.99	-
Sucking	.98	.93	-
Mother:			
Stimulating with nipple	.85	.77	-
Stimulating infant -			
Cheek or chin	.69	(a)	-
Body, general	.76	-	.88 (b)
Talk	.94	.94	.89
Smile	.83	(a)	.86
Hold away	-	-	.97 (c)

(a) Correlation was very low; variable was omitted in analysis of data.

(b) Our criteria were modified after 13 subjects had been observed, so only 5 subjects were included in this correlation.

(c) Our criteria were modified after 7 subjects had been observed so only 11 subjects were included in this correlation.

Table 3

Mean Number of Periods Used in Each Major Category of Activities

	Primiparas		Multiparas		Direction of difference	F (df=1/36)	p
	Males (N = 10)	Females (N = 10)	Males (N = 10)	Females (N = 10)			
Breast-feeding	4.7	4.0	3.0	2.3	P > M	5.15	.05
Water-feeding	2.5	3.8	2.3	1.3	P > M	8.83	.01
					Interaction	6.41	.05
Non-feeding	6.8	7.3	4.8	3.1	P > M	17.41	.001
Total	14.0	15.1	10.1	6.7	P > M	17.41	.001

Table 4

Mean Percent of Breast-Feeding Time that Each Behavior was Observed

	Primiparas		Multiparas		Direction of difference	F (df=1/36)	p
	Males (N = 10)	Females (N = 10)	Males (N = 10)	Females (N = 10)			
Infant:							
Not attached to breast	30.0	21.5	11.6	10.7	P > M	3.47	.10(a)
Attached and sucking	28.1	27.9	40.7	49.7	P < M	4.94	.05
Mother:							
Stimulate breast	22.4	14.9	14.9	6.0			NS
Stimulate cheek or chin	4.3	8.5	4.8	3.4			NS
General stimulation	54.0	46.7	35.8	26.4	P > M	6.47	.05
Talk	15.7	35.0	9.8	7.3	P > M	10.59	.01
					Interaction	4.43	.05
Smile	0.6	5.8	1.8	1.5			NS

(a) The significance level is $p < .01$ in an analysis which removed differences due to presence or absence of lactation.

Table 5

Mean Percent of Water-Feeding Time that Each Behavior Occurred

	Primiparas		Multiparas		H*	p
	Males (N = 10)	Females (N = 10)	Males (N = 9)	Females (N = 6)	(df=3)	
Infant sucking	56.2	46.7	55.4	36.0		NS
Mother:						
Stimulating	10.3	11.1	2.1	1.0	9.34	.05
Talk	18.8	24.8	13.0	12.9	8.06	.05
Smile	14.5	23.5	18.2	14.4	6.36	.10

*Kruskal-Wallis H statistic.

Table 6

Mean Percent of Time Each Behavior Occurred

During Non-Feeding Activities

	Primiparas		Multiparas		Direction of difference	F	p
	Males (N = 10)	Females (N = 10)	Males (N = 10)	Females (N = 10)		(df=1/36)	
Mother:							
General stimulation	68.3	63.6	63.0	76.8	-	-	NS
Holds infant away	1.3	1.5	2.4	2.7	-	-	NS
Talks	3.2	5.1	2.9	3.8	F > M	3.58	.10
Smiles	0.3	1.1	0.4	0.6	-	-	NS

Table 7

Mean Percent of Time Each Major Behavior Occurred

During Total Observation

	Primiparas		Multiparas		Direction of difference	F (df=1/36)	P
	Males (N = 10)	Females (N = 10)	Males (N = 10)	Females (N = 10)			
Mother:							
General stimulation	45.0	51.3	33.5	33.3	P > M	5.65	.05
Talk	20.5	39.0	13.5	12.2	P > M	10.84	.01
					Interaction	3.66	.10
Smile	4.2	7.3	3.5	4.6			NS

Table 8

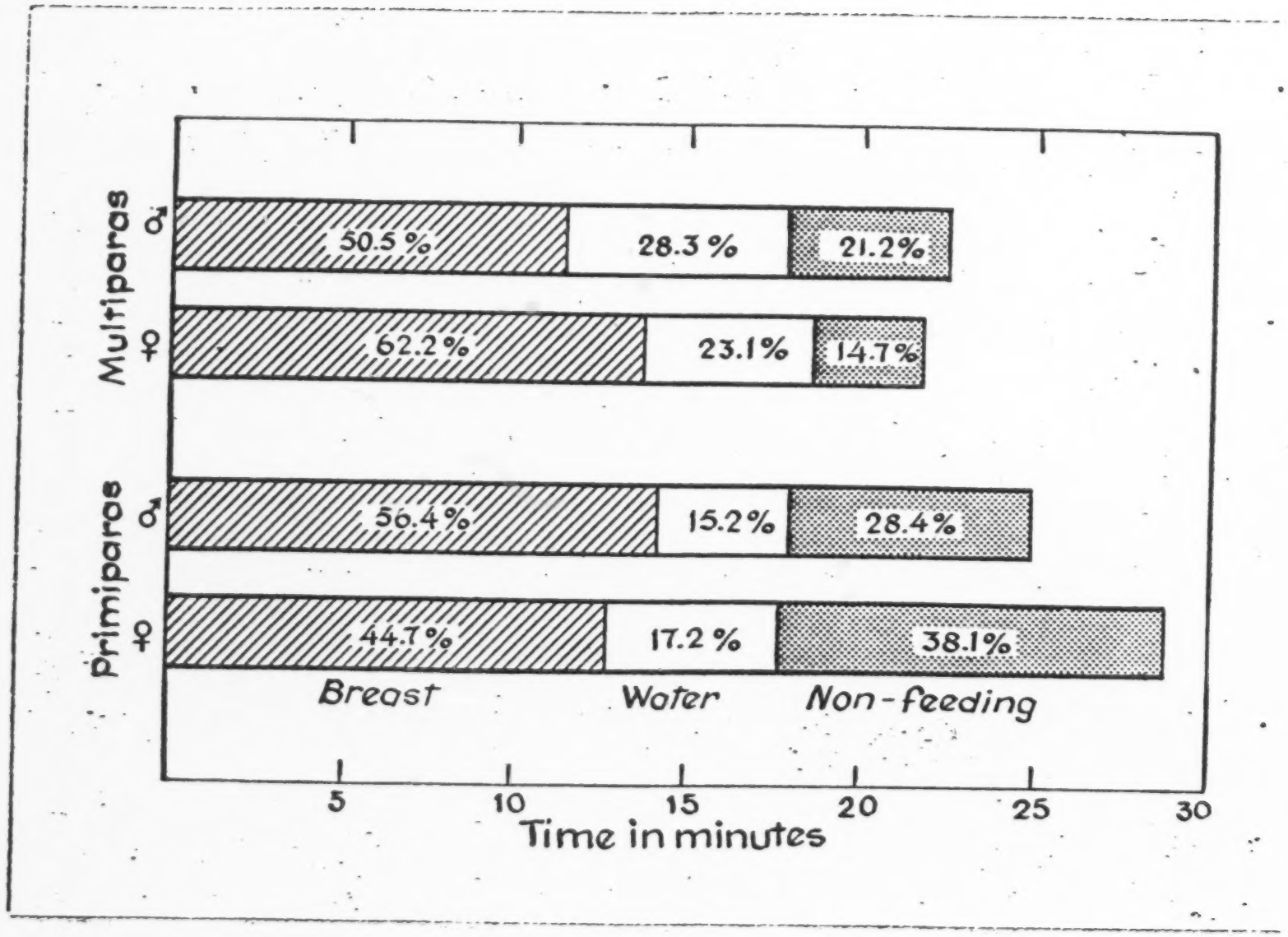
Mean Number of Weeks Mothers Nursed Infants

Primiparas		Multiparas	
Males	Females	Males	Females
(N = 10)	(N = 10)	(N = 10)	(N = 10)
15.4 ± 10.7*	25.7 ± 14.1	17.8 ± 15.3	15.7 ± 15.5

* Mean ± standard deviation.

Figure Caption

Fig. 1. Mean total time spent for the feeding observation by each of the four groups is indicated by the full length of the four bars. Segments of the bars indicate the number of minutes devoted to breast-feeding, water-feeding, and to non-feeding activities. Percents of total time devoted to each of these three activities are indicated within the segments.


Multiparas
♂
50.5 %
28.3 %
21.2%
♀
62.2%
23.1%
14.7%
Primiparas
♂
56.4%
15.2%
28.4%
♀
44.7%
17.2 %
38.1%
Breast
Water
Non-feeding
5
10
15
20
25
30
Time in minutes